2016 LVAIC DIGITAL TOOLS CONFERENCE AND WORKSHOP

TECHNOLOGY COOKBOOK

#LVAICDigitalTools

Welcome!

The Lehigh Valley Association for Independent Colleges is a unique consortium that consists of the six member colleges and universities in the Lehigh Valley, as well as six associate member institutions in the eastern Pennsylvania region. Through innovation in collaboration and community, LVAIC aims to provide academic and business support to each member. LVAIC's mission is to promote and facilitate inter-institutional cooperation between and among the independent colleges and universities of the Lehigh Valley in order to enrich and increase opportunities for students, faculty and staff.

This cookbook is a compilation of the applications and tools that will be discussed at the 2016 LVAIC Digital Tools Workshop to be held on **May 25, 2016 at Lafayette College**. These "recipes" are to be used as guidelines to get you started exploring the technology. Each recipe includes the title of the corresponding presentation, the digital tool that will be used, a short description of the tool or tools involved, key terms associated with the tool, directions for downloading and/or beginning to use the tool, and useful links to help get you started.

Please use #LVAICDigitalTools throughout the conference to connect on Twitter!
Don't have a Twitter account? Click here to sign up for one (please note Twitter will be used throughout the workshop on Wednesday, so it is highly recommended you have one ahead of time). You can also download the Twitter app here.

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By Presentation Title

By Digital Tool

Using Clickers to Maximize Student Engagement

Bruce Whitehouse, Lehigh University

Abstract:
For eight years, I have been using Clicker devices in conjunction with TurningPoint software to assess student learning and participation in a large lecture-based survey course (40 to 100 students). While this is not a new technology, recent software improvements have expanded the ways instructors can use it in the classroom. In my presentation I will discuss the strengths and weaknesses of the Clicker and TurningPoint systems and share lessons learned on productive ways to apply this technology to maximize students' engagement during class time, gauge how well they have learned information and concepts both in assigned readings and during lecture, record their participation, and foster interactive, small-group learning within the larger lecture class.

Tools:
Clickers
Clickers are an interactive technology that enables instructors to pose questions to students and immediately collect and view the responses of the entire class. Students click in their answers using remote transmitters (or mobile devices) they purchased/rented. The system instantly collects and tabulates the results, which instructors can view, save, and (if they wish) display anonymously for the entire class to see.

TurningPoint Software
With options that range from quick polling or committee voting to standardized exams or institutional evaluations, TurningPoint allows instructors to strengthen teaching practices and administrators to make data-driven decisions. Prepare your students for real-world experiences with tools that engage, monitor, and measure the learning process in a simple, versatile, and meaningful way.

Keyword/Tags:
Clickers; Student Response; Assessment; Student Engagement

Directions:
1. Visit the [TurningPoint software download webpage](#) and fill in your information. You will receive a users guide in the e-mail address you supply.
2. Click the "Download" prompt and follow the setup instructions.
3. Students respond either [via a mobile device](#) or [with a clicker](#).

Resources:
- Getting Started with TurningPoint: www.turningtechnologies.com
- Users Guide: www.turningtechnologies.com/support/turningpoint-5

Computer Simulations for Cell Biology, A Collaboration

Lara Goudsouzian, DeSales University

Abstract:

We have developed and implemented a laboratory exercise appropriate for a sophomore or junior-level Cell Biology course. Students are assigned two Saccharomyces cerevisiae (yeast) cultures, each of opposite mating type. Mating pheromone is added to each culture, and the growth and morphology of the individual mating types is assayed at regular intervals over the course of several hours. Students become practiced in the use of a spectrophotometer to determine the concentration of cells in growth medium. Students then prepare graphs of their data, generating a growth curve to demonstrate that yeast cells will respond only to the presence of the opposite-sex mating factor.

This year, we have entered into collaboration with a Computer Science seminar course on campus. The students in this course were assigned the task of creating supporting materials for the yeast mating labs, with the Cell Biology professor as the group's formal "client". In accordance with the client's requests, the students have generated two different computer simulations of the laboratory. There is a 3-dimensional simulation most appropriate for those who take Cell Biology lecture without enrolling in the laboratory, and a 2-dimensional simulation most appropriate for students who are performing the traditional laboratory. The 3-D simulation functions to replace the lab at institutions with limited teaching laboratory space or other experimental resources. The 2-D simulation supports the learning of students as they perform the lab. As most of the timepoints are taken outside of the set laboratory time, and therefore away from the supervision of the professor, this simulation models ideal results for the student as he or she progresses through the lab alone. We have preliminary assessment data on student attitudes towards the laboratory and accompanying simulations.

Tools:

2-D Simulations – HTML, CSS, JQuery, Java Script
Web development tools allow web developers to test and debug code. They are different from website builders in that they do not assist in the direct creation of a webpage, rather they are tools used for testing the user facing interface of a website or web application.

3-D Simulations – Unity Game Development Software
You can create any 2D or 3D game with Unity with ease that is highly-optimized and beautiful, and you can deploy it with a click to multiple platforms. Using Unity's integrated services can speed up your development process, optimize your game, connect with an audience, and achieve success.

Keywords/Tags:
Simulations; Collaboration; Empirical Inquiry

Directions:
- Find out what web development package(s) your campus supports or visit the links below.

Resources:
- Getting Started with Unity: https://unity3d.com
- Unity Tutorials: https://unity3d.com/learn
- Unity Community Network: https://unity3d.com/community

High-Quality Videos for Flipping Civil Engineering Courses

Gerard Lennon, Lehigh University

Abstract:

The development of high-quality professional studio recordings was an effective way to provide key basic knowledge and comprehension outside of the classroom. The classroom time that was freed up was replaced by effective active learning techniques using higher achievement levels, e.g. Bloom's cognitive domain levels 3 (apply), 4 (analyze) and 5 (evaluate). The videos have been used in three undergraduate Civil and Environmental Engineering courses at Lehigh University: a required laboratory course for BS Environmental Engineers, and electives in groundwater and in modeling of environmental systems that include four different BS majors. Students benefited greatly by being able to replay difficulty concepts, or skip through parts that overlapped if they took more than one of these courses.

Steve Lichak recorded Dr. Lennon in the Digital Media Studio using a green screen, teleprompter run by an undergraduate student to coordinate with PowerPoint, displayed on a monitor and later edited in place of the green screen. The student used Final Cut Pro X editing software to intersperse video clips of laboratory experiments demonstrating concepts with theory presented on PowerPoint. Final video files and full transcripts were posted on Google Drive, available to students from smart phones, tablets, and computers. QR codes and links embedded in slides provide access to all videos created as part of this project. The topics of the recordings with experiments include open channel flow, groundwater flow and contaminant transport in a 10-meter long tank, and stability of objects.

Tool:

Final Cut Pro X
Built to meet the needs of today's creative editors, Final Cut Pro is a dynamic, Mac-based editing interface that lets you experiment freely while working with extraordinary speed and precision.

Keywords/Tags:
Flipped Classroom; Instructional Videos; Mobile Learning

Directions:
- Visit the Final Cut Pro X website on your Mac device for the free trial or download the software from the Apple Store.

Resources:
- Getting Started: www.apple.com/final-cut-pro/
- Tech Specs: www.apple.com/final-cut-pro/specs/
- Users Guide: www.apple.com/final-cut-pro/resources/

Using Apple TV as an Instructional Device

Mary Roth, Lafayette College

Abstract:
By attaching an Apple TV to the standard set up in a smart classroom, I improved the sense of community in my courses and was able to more smoothly integrate technology in classroom activities. My primary use of the Apple TV was to connect my iPad to the system and, from my seat among the students, share whatever was on my iPad screen with the class. This approach meant that I no longer needed to stand behind the class podium or at the board – everything I presented (e.g., videos, PowerPoint slides, web sites, examples of student writing) and my note-making (e.g., writing on a virtual "white board") could all be completed from my seat with the students. The approach also allowed students with Apple devices to connect to the system directly and students with non-Apple devices were able share documents with me through Google file options allowing me to easily bring their files to the screen. The technology has changed the way I teach, allowing me greater flexibility in the classroom and increasing student interaction and engagement.

Tool:
Apple TV
Apple TV is a digital media player and a microconsole developed Apple, Inc. It is a small network appliance and entertainment device that can receive digital data from a number of sources and stream it to a capable TV for playing on the TV screen.

Keywords/Tags:
Collaboration; Student-Centered Learning; Mobile Learning

Directions:
- Find out if your campus supports Apple TV or visit the links below.

Resources:
- Getting Started: www.apple.com/tv/
- Tech Specs: www.apple.com/tv/specs/
- Experience: www.apple.com/tv/experience/

Tools for Classroom Assessment Techniques

Tim Clarke, Muhlenberg College

Abstract:
While there is genuine benefit to flipped instruction, one pedagogical element that suffers is the use of CATs (Classroom Assessment Techniques – not feline friends). Things like the "one minute paper" and the "muddiest point" are great mechanisms for assessing your teaching, but these are more difficult to administer at a distance. The use of video annotation tools like Zaption, PlayPosit (fka eduCanon), and HapYak allow instructors to utilize a variety of CATs with their flipped or distance instruction. We will examine and discuss ways these tools can not only provide valuable feedback to instructors, but also transform video lectures from passive content delivery to active and engaged learning.

Tools:

Zaption
Turn passive videos into active learning, which is perfect for flipped classrooms, in-class presentations, and blended learning. Add annotations and questions to YouTube, Vimeo, and your own videos to engage your students and deepen their understanding of key concepts.

PlayPosit
PlayPosit is an online learning environment to create and share interactive video lessons. Teachers begin with any online video and transform what is traditionally passive content into an active experience for students, with time-embedded activities.

HapYak
With templates, core projects, and robust APIs, you can turn every one of your videos into measurable tools that turn viewers into leads and leads into customers.

Keywords/Tags:
Flipped Classroom; Instructional Videos; Assessment; Annotating

Directions:
To create videos with Zaption:
1. Visit the Zaption website on your tablet or computer.
2. Click the link to create an account and complete the survey.

To create videos with PlayPosit:
1. Visit the PlayPosit website on your tablet or computer.
2. Click the link to sign up for an account. You will receive a users guide in the e-mail address you supply.

To create videos with HapYak
1. Visit the HapYak website on your tablet or computer.
2. Click the link to "Try it Free" and create an account by completing the survey.

Resources:
- Getting Started with Zaption: www.zaption.com
- Zaption Support: https://zaption.zendesk.com/hc/en-us
- Getting Started with PlayPosit: www.playposit.com
- PlayPosit Users Guide: https://docs.google.com/document/d/1OutYFW1PGZlx59zId2u97oKHN3YlURLkkgfMy14LMOE/edit
- Getting Started with HapYak: www.hapyak.com
- HapYak Users Guide: https://corp.hapyak.com/learn/

Build-it-Yourself Computers for Creative Problem-Solving

Jeremy Littau, Lehigh University

Abstract:
I used build-it-yourself computers in a class to accomplish two pedagogical goals: to teach empirical methods of information gathering and analysis, and to spark creative thinking in problem-solving. I am leading a class of six that built our own temperature sensors using Arduino build-it-yourself kits. We started with general knowledge of DIY computers and I let them pick the sensor types we'd pursue by asking what we wanted to know. The students, through conversation and brainstorming, connected with past research on building temperature and factors such as cognitive processing and memory, and we decided we would do a "heat map" of Linderman Library, a key study space on campus, with the end goal of telling the story to the campus. The class had to think through previous research, then what we wanted to know, then what we'd measure, then what we had to build. This taught students not inclined to think like scientists (and in truth, a little scared of scientific methods) empirical approaches in a hands-on way. It also introduced them to the increasingly valuable skill of data analysis into their learning process. Finally, the hands-on process has allowed me the rare chance to connect journalism to maker communities, and it has helped them envision ways to creatively answer societal questions when the professor didn't have much more prior knowledge than they did. Even though we had a storytelling focus, the applications in terms of empirical inquiry and data analysis are applicable across disciplines.

Tool:

Arduino
Arduino is an open-source prototyping platform based on easy-to-use hardware and software. Arduino boards are able to read inputs – light on a sensor, a finger on a button, or a Twitter message – and turn it into an output – activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board.

Keywords/Tags:

Data Collection; Data Analysis; Empirical Inquiry; Creative Thinking/Problem Solving; Storytelling

Directions:

1. Visit the Arduino website to determine the best-suited kit/purchase a starter kit.
2. Download the Arduino software to your device.
3. Follow the instructions to install the software.

Resources:

- Getting Started: www.arduino.cc
- Users Guide: http://www.arduino.cc/en/Guide/HomePage
- Tutorials: https://www.arduino.cc/en/Tutorial/HomePage
- Language Reference: http://www.arduino.cc/en/Reference/HomePage

Teaching with Online Research: The Easton Library Company Database

Chris Phillips, Lafayette College

Abstract:
Over the past five years, I have directed a team engaged in making a database of the loan records from the Easton Library Company (1811-1862). As the database has developed, I have used beta versions with my classes at Lafayette to help students find new ways to design their own research questions. In my English 206: Literary History course in particular, students design projects starting from the big question—what if we studied literary history from the perspective of demand (readers) rather than supply (authors/publishers)? The database helps students gain insight into reading patterns of 19c Easton residents, but it also brings them up against the limits of what a digital tool of this can do for them. Students often comment that you can get facts from a database query but not a thesis—at best, you get new questions that require new methods to answer. This complex relationship to data and its analysis, much more familiar to students in social and natural sciences, becomes evident to students of literature even as they look for ways to integrate database queries with more traditional methods of research—and they begin to look more critically at the design of library databases like JSTOR, thus enhancing their information literacy. In talking with me and my collaborators about the process of making the database, the students also gain insight into how knowledge comes to be created in the digital humanities; this has led some students to pursue further work in DH, either with me or other faculty and staff.

Tool:
Easton Library Company Database
The project focuses on making available for study the loan records of the Easton Library Company (ELC), a shareholding library that was the first public library in Pennsylvania's Lehigh Valley. Five folio-size loan ledgers cover the ELC's entire history making the collection one of the most extensive pre-Civil War library archives in the nation that shed light on library history, literary history, social history, the history of Easton and Northampton County, and other fields of study.

Keywords/Tags:
Data Collection; Data Analysis; Digital Humanities

Directions:
1. Visit the Easton Library Company Database website.
2. Select "Browse Records" to see Loans, People, or Items.
3. Select "Analyze Data" to do Basic or Advanced Data Visualization.

Resources:
- Easton Library Company Database: http://elc.lafayette.edu/

Using Videos for Content Reinforcement and Immediate Feedback

Pranshu Gupta, DeSales University

Abstract:
During LVAIC Digital Tools 2015 Workshop, I came across this tool that I considered using in my classroom. It is sometimes difficult to use a digital tool in computer science or technology courses because students in these classes learn to create such tools therefore they are also very critical of such tools (which is a skill that they learn in some courses to become a better designer). There are courses where understanding and retention of terminology is important but there is also need for reinforcing logic, syntax and methodologies/technical processes, such as in Programming and Computer Networking courses. I decided to use the tool called PlayPosit (formerly eduCanon) in fall 2015 in my courses. It is a web application that allows users to search for videos from various websites, such as YouTube and add questions at different locations in the video, creating an interactive learning environment. It is not only watching the video for information but students answering questions to receive immediate feedback to assess the retention of material. The tool was used in three courses teaching C/C++ (freshmen), Java (sophomore/junior), and Computer Networking (junior/senior). It was used by a diversified set of students and majority of the students provided a very positive feedback. Even if the student did not score high on the question list, they had a very positive learning experience. Other advantages of this tool are that videos can be shared among faculty and can be edited based on class needs.

Tool:
PlayPosit
PlayPosit is an online learning environment to create and share interactive video lessons. Teachers begin with any online video and transform what is traditionally passive content into an active experience for students, with time-embedded activities.

Keywords/Tags:
Instructional Videos; Assessment; Student-Centered Learning; Annotating

Directions:
1. Visit the PlayPosit website on your tablet or computer.
2. Click the link to sign up for an account. You will receive a users guide in the e-mail address you supply.

Resources:
- Getting Started: www.playposit.com
- Users Guide: https://docs.google.com/document/d/1OutYFW1PGZlx59zld2u97oKHN3YlURLkkgfMy14LMOE/edit

Google Docs for Process-Oriented Guided Inquiry Learning

Clif Kussmaul, Muhlenberg College

Abstract:

This presentation will describe and demonstrate the use of Google Docs for classroom-based team activities, particularly in the context of Process-Oriented Guided Inquiry Learning (POGIL). POGIL is an evidence-based instructional strategy in which students work during class on activities that are specifically scripted to guide them to create their own understanding of key concepts, and to develop key process skills like communication and problem solving. POGIL has a 20-year history of NSF support, and numerous studies have shown that it increases student learning and other outcomes.

With Google Docs, students can collaboratively edit their team's activity, which can increase engagement, and provides an easy-to-read final version for later reference. Teachers can monitor and annotate each team's activities during class, and review them later to assess student understanding and progress, and to identify ways to improve the activity. Teachers can also use Google Docs to collaboratively develop and revise activities, using an add-on that can generate student versions of the activity from a master version with answers and notes on classroom facilitation. In the future, we hope to extract information from the Google Doc version history to better understand how teams work and which parts of the activities are most problematic.

Tool:

Google Docs
Google Docs is an online word processor that lets you create and format text documents and collaborate with other people in real time either from scratch or previously created and uploaded Word documents.

Keywords/Tags:

Process-Oriented Guided Inquiry Learning; Collaboration; Annotating; Assessment

Directions:

1. Visit the Google website. If you already have a Google account, sign in. If you do not have a Google account, you will need to create one.
2. After signing in, click the square of nine boxes in the upper right corner of the page. Select the "Drive" option (or you can go straight to Google Docs).
3. Once in the Google Drive, select the "New" prompt in the upper left corner. Select the "Google Docs" option in the drop-down list to create a new Google Doc.

Resources:

- Getting Started with Google Docs: https://docs.google.com
- Google Docs Users Guide: https://apps.google.com/learning-center/products/docs/#/list
- Google Drive Support: https://support.google.com/docs?hl=en&p=#topic=2811805
- Information on POGIL: http://pogil.org or http://cspogil.org
- POGIL Classroom Activities: http://cspogil.org/tiki-index.php?page=Classroom+Activity+Utility

Technology for a Community-Based Learning & Research Collaboration on Two Campuses

Sabrina Terrizzi, Moravian College; Gary Kaskowitz, Moravian College; Chris Ruebeck, Lafayette College

Abstract:

Our inter-institutional collaboration features two dimensions: technology bridges and community-based learning. Our technology-oriented work began with a new quantitative data course during the Fall 2015 semester and continued in linking two marketing research courses' community projects during Spring 2016. Students' exposure to issues in primary data collection, data cleaning, and a limited Community-Based Learning and Research (CBLR) project began in the first course. Students in that class also produced video tutorials on Institutional Review Boards for use in the later two classes. In the marketing research classes, we incorporated collaboration environments that could bridge the two institutions' differing course management systems. The students then collaborated on critiquing and editing the data collection and analysis experiences of the other class's CBLR project. We will discuss what we learned from putting these goals into practice, where we were successful in bridging gaps, and where feasibility required us to scale back collaboration to more limited and realistic—yet ultimately effective—levels.

Tools:

Screencasting
Students used FlowVella slidedecks, PowerPoint, GoAnimate, SnagIt, iMovie, and Windows MovieMaker to create screencast videos for other classes to view.

Google Communities
Google Communities resemble traditional message boards built around a central theme where followers interact with others and a community moderator posts content to the Community.

Keyword/Tags:
CBLR; Cross-Campus Collaboration; Instructional Videos; Student-Centered Learning; Flipped Classrooms

Directions:
To create screencasts:
- Find out what package(s) your campus supports or visit the links below.

To create a Google Community:
1. Visit the Google website. If you already have a Google account, sign in. If you do not have a Google account, you will need to create one.
2. After signing in, click the square of nine boxes in the upper right corner of the page. Select the "Google+" option.
3. In the left column under "Home" select "Communities." Select the "Yours" category, click "Create a Community," name it, and set preliminary privacy settings. Select "Done."
4. Within the Community, select the 3 connected dots in the upper left corner. Click "Invite Members" to add members to the Community via their Gmail address.

Resources:
- Getting Started with FlowVella: https://flowvella.com
- Getting Started with GoAnimate: https://goanimate.com
- Getting Started with SnagIT: https://www.techsmith.com/snagit.html
- Getting Started with iMovie: http://www.apple.com/mac/imovie/
- Getting Started with MovieMaker: http://windows.microsoft.com/en-us/windows/movie-maker
- Google Communities Support: https://support.google.com/plus/answer/2872671?hl=en

Building Critical Media Literacy on Two Campuses

John Sullivan, Muhlenberg College; Elizabeth Ortiz, Cedar Crest College; James Brancato, Cedar Crest College

Utilizing a Teagle grant, faculty members at Muhlenberg and Cedar Crest Colleges created two blended/hybrid courses: Media and Society/Media Literacy, and Media Industries. These courses are dedicated to helping students explore the political economy of media industries and how it shapes media content as well as social values and structures. Specifically, we want to help students to better understand media structures and power, ideological messages in media, and develop awareness of the centrality of media in a democracy. Additionally, we sought to help students understand the need to be both critical media consumers and producers in our society.

Using a shared learning management system across the campuses (Moodle), John Sullivan (Muhlenberg), Elizabeth Ortiz (Cedar Crest), and Jim Brancato (Cedar Crest) created joint classroom experiences such as interactive lectures, video presentations, and shared research projects, including course reading responses, discussion forums, and online presentations. These joint projects helped students become more critical media consumers. We also collaborated in an important cross-campus event in the Fall 2016 – Media Literacy Week – held jointly on the two campuses. Based upon our experiences in developing these hybrid courses, we discovered many exciting new pedagogical possibilities for our students via the online activities. Based upon semester-end student surveys, however, we also learned that students felt the need for more involved and consistent instructor feedback and that they often lacked the self-motivation necessary to stay current with the course.

Tool:

Moodle
Moodle is a free, open-source learning management system designed to provide educators, administrators, and learners with a single robust, secure, and integrated system to create personalized learning environments.

Zaption
Turn passive videos into active learning, which is perfect for flipped classrooms, in-class presentations, and blended learning. Add annotations and questions to YouTube, Vimeo, and your own videos to engage your students and deepen their understanding of key concepts.

Keywords/Tags:
Cross-Campus Collaboration; Instructional Videos; Student-Centered Learning; Flipped Classrooms

Directions:
To collaborate through an LMS:
- Find out what LMS your campus supports and how you can collaborate.

To create videos with Zaption:
1. Visit the [Zaption website](#) on your tablet or computer.
2. Click the link to [create an account](#) and complete the survey.

Resources:
- Getting Started with Zaption: www.zaption.com
- Zaption Support: https://zaption.zendesk.com/hc/en-us

Leveraging Technology for Critical Reflection and Service-Learning

Sarah Stanlick, Lehigh University

Abstract:
Service learning is a high-impact experience that explores issues of citizenship, social justice, and community engagement. To have maximum transformative impact, critical reflection is essential to processing and making meaning for the learner. As technology progresses and new tools emerge, the ease and depth by which reflection can be conducted is enhanced. This presentation delves into technological reflection tools and provides context/examples to support implementation in service-learning and community engagement endeavors.

Tools:

Piktochart
Piktochart is a web-based infographic application which allows users without intensive experience as graphic designers to easily create professional-grade infographics using themed templates.

Google My Maps
Create custom maps to share and publish online with Google My Maps. You can make maps that show different kinds of information.

Keywords/Tags:
Infographics; Geospatial Tools; Critical Reflection; Service-Learning

Directions:
To access Piktochart:
1. Visit the Piktochart website.
2. Select "Start for Free" and create an account.
3. Click the activation link in your email.

To access Google MyMaps:
1. Visit the Google MyMaps website.
2. Click the link to create a new map.
3. Sign in with your Google account to save your map.

Resources:
- Getting Started with Piktochart: https://piktochart.com
- Piktochart Support: http://support.piktochart.com/hc/en-us
- Getting Started with Google MyMaps: https://www.google.com/maps/d/u/0/home
- MyMaps Users Guide: https://support.google.com/mymaps/answer/3024396?hl=en

Incorporating Real Data into Statistics Classes

Trent Gaugler, Lafayette College

Abstract:

Incorporating real data into statistics classes would be impossible without the students having capabilities with at least one statistical software package or programming language. The ability for students to see concepts in action in a meaningful way is powerful, and is often the aspect of the course that students say has the biggest impact on their learning experience. I use software (R, SAS, SPSS, Excel, etc.) in varying ways across different courses, but I never limit the use to one setting (e.g. a lab) – the fact that students see it as an integral part of the course underscores that it is an integral part of being a statistician. In addition to daily doses of the technology, I incorporate larger data analysis projects in every class I teach, and in order for this to have maximum meaning to the students, as often as possible the data comes from a client who has a vested interest in the outcome. This past year, I've had students analyze a congregant satisfaction survey from a local church, and analyze sales data from Crayola. When the students are able to explore large, complex, real world data and then must communicate their findings to real clients, they gain invaluable experience.

Tools:

R

R is a free software environment for statistical computing and graphics. It compiles and runs on a wide variety of UNIX platforms, Windows, and MacOS.

SAS

SAS transforms data into insights that give a fresh perspective on business. You can identify what's working. Fix what isn't. And discover new opportunities. Turn large amounts of data into knowledge you can use.

SPSS

IBM SPSS Statistics is an integrated family of products that addresses the entire analytical process, from planning to data collection to analysis, reporting and deployment. With more than a dozen fully integrated modules to choose from, you can find the specialized capabilities you need to increase revenue, outperform competitors, conduct research, and make better decisions.

Excel

Microsoft Excel is a spreadsheet developed by Microsoft for Windows, Mac OS X, Android, and iOS. It features calculation, graphing tools, pivot tables, and statistical functioning.

Keywords/Tags:

Data Collection; Data Analysis; Empirical Inquiry

Directions:

- Find out what package(s) your campus supports or visit the links below.

Resources:

- Getting Started with R: www.r-project.org
- R Users Guide: https://cran.r-project.org/manuals.html
- Getting Started with SAS: www.sas.com
- SAS Training: http://support.sas.com/training/
- Getting Started with SPSS: http://www-01.ibm.com/software/analytics/spss/products/statistics/
- SPSS Tutorials (not affiliated with SPSS): http://www.spss-tutorials.com
- Getting Started with Excel: https://products.office.com/en-us/excel
- Excel Users Guide: https://support.office.com/en-us/excel

Students Collect Geolocated Field Data Quickly and Easily with KoBoToolbox

Benjamin Carter, Muhlenberg College; Kimberly Heiman, Muhlenberg College

Abstract:

KoBoToolBox is an easily deployable data collection system ideal for student-centered fieldwork. Data is collected via a web browser on any device, mobile, or otherwise. It even works off-line – no Wi-Fi or cellular data connection needed! Deployed during Fall 2015 within the clustered courses, Degradation and Restoration (Heiman) and Historical Ecology (Carter) at Muhlenberg College, the initial pedagogical goal was to provide students with geospatial data collected by their own hands, and with which they had an personal connection so that they could analyze geospatial patterns of human impact on the local environment. Students were able to successfully recognize, assess, and incorporate these data. However, the ease of use of the tool also allowed students to both reflect deeply and critically on the process of data collection; resulting in additional pedagogical "bang-for-the-buck."

Tool:

KoBoToolbox
KoBoToolbox is a suite of tools (available on any device) for field data collection for use in challenging environments. Easily create survey forms through the intuitive and powerful tool. Quickly and reliably collect survey data any device, online or offline, in any language and with complex skip logic. Inspect data moments after it was collected - or download it for advanced analysis in other software in Excel, CSV, KML, and other formats.

Keywords/Tags:

Data Collection; Data Analysis; Geospatial Tools; Student-Centered Learning

Directions:

1. Visit the KoBoToolbox website on your tablet or computer.
2. Click the link to create an account.
3. Click the activation link in your email.

Resources:

- Getting Started: www.kobotoolbox.org
- Support: http://support.kobotoolbox.org

Doceri: Generate Instructional Video with Real-Time Annotation

Keri Colabroy, Muhlenberg College

Abstract:
Doceri is a tablet app that allows the instructor to pre-record content or screencast live (while projecting, if desired), while also annotating the content in a variety of ways - including freehand drawing. Doceri can mirror a computer screen and allow users to annotate (live or pre-recorded) over PowerPoint slides or other media. Doceri also enables the instructor to freely create content on an empty "whiteboard" space for on-the-spot illustration or pre-recorded "flips". I have implemented this tool in a variety of chemistry classrooms to both record my live lectures and flip content for online learning. A tablet and wifi connection are required, and the Doceri desktop application is recommended. Doceri has improved student learning by allowing classes to review complex content over and over again, by video. It has also allowed me to "flip" instruction of instrumentation theory and data analysis - allowing more time in class for actually doing the data analysis itself.

Tool:
Doceri
Doceri is a professional interactive whiteboard tablet app (available on any device) with sophisticated tools for hand-drawn graphics and built-in remote desktop control. Originally designed for teachers, Doceri is used by creative individuals in myriad roles and professions from education to entertainment.

Keywords/Tags:
Flipped Classroom; Instructional Videos; Annotating; Mobile Learning

Directions:
1. Visit the Doceri website on your tablet or iPad.
2. Click the link to download the app in the Apple Store. Once downloaded, open the app.

Resources:
- Getting Started: www.doceri.com
- Users Guide: http://doceri.com/support/knowledgebase.php
- Frequently Asked Questions: http://doceri.com/support/knowledgebase.php?article=26

Using Augmented Reality to Build Interactive Instructional Materials

Farah L. Vallera, LVAIC/Lafayette College

Abstract:
Providing an innovative way to connect abstract ideas with real world examples can make learning more successful, and students have a higher likelihood of learning if they are engaged with their content and materials. Using augmented reality and mobile devices, combined with videos that offer authentic, real world examples that illustrate complex, abstract concepts can increase student understanding and success - particularly with digital learners. Using Aurasma, an augmented reality program, students activate supplemental instructional videos by scanning images in their course textbooks with mobile devices to explore concepts further. Connecting those videos to the course textbooks can also encourage students to interact with the materials and read their texts more often.

Tool:
Aurasma
Augmented reality is a media platform that provides overlays of virtual information atop of real-world objects. Aurasma is a free augmented reality (AR) application (available on any device) where videos, audio, websites, or 3D content are activated by scanning static images or quick response (QR) codes.

Keywords/Tags:
Augmented Reality; Mobile Learning; Instructional Videos; Animated Photographs

Directions:
To create "auras" on computers:
1. Visit the Aurasma Studio website on your tablet or computer.
2. Click the link to sign up for an account.

To access videos on mobile devices:
1. From your "App Store" or "Google Play", search for and download Aurasma.
2. Share your location and access to the camera.
3. Log in with the account information you just created.

Resources:
- Getting Started: www.aurasma.com
- Building Auras: https://studio.aurasma.com
- Community Network: https://aurasma.zendesk.com
- Animating Photos: www.blabberize.com
- Animating Photos: www.ifunface.com